

**What is claimed is:**

1. A method of sensing the activity of neural tissue, the method comprising the steps of:  
placing an electrode in a blood vessel proximate to the neural tissue; and  
monitoring a signal on the electrode,  
wherein the signal is indicative of the activity of the neural tissue.
2. The method of claim 1, wherein the electrode comprises a sensing end, the sensing end of the electrode being placed in the blood vessel proximate to the neural tissue.
3. The method of claim 1, wherein the electrode is inserted into the blood vessel at a point upstream of a junction with another blood vessel.
4. The method of claim 3, wherein a sensing end of the electrode is deployed to a point downstream of the junction.
5. The method of claim 1, comprising the steps of:  
placing a further electrode on the neural tissue proximate to the electrode;  
applying a stimulus to the neural tissue;  
monitoring a further signal on the further electrode; and  
comparing the signal to the further signal.
6. The method of claim 1, wherein the electrode comprises a nano-electrode.
7. The method of claim 1, wherein the electrode comprises an array of nano-electrodes.
8. The method of claim 7, wherein the nano-electrodes have different lengths.

9. The method of claim 6, wherein the nano-electrode comprises a cup-like end.
10. A device for sensing the activity of neural tissue comprising:  
a catheter; and  
an electrode, the electrode being deployed from the catheter in a blood vessel proximate to the neural tissue, wherein a signal on the electrode is indicative of the activity of the neural tissue.
11. The device of claim 10 comprising:  
a signal processor, the signal processor being arranged in the catheter and being coupled to the electrode.
12. The device of claim 11, wherein the signal processor includes:  
an amplifier, the amplifier being coupled to the electrode; and  
a digital converter, the digital converter converting the output of the amplifier into a digital representation.
13. The device of claim 12, wherein the digital converter includes a Schmitt trigger.
14. The device of claim 10 comprising a plurality of electrodes.
15. The device of claim 14 comprising:

a signal processor, the signal processor being arranged in the catheter and being coupled to the plurality of electrodes.

16. The device of claim 15, wherein the signal processor includes:

a plurality of amplifiers, each of the plurality of amplifiers being coupled to one of the plurality of electrodes;

a plurality of digital converters, each of the plurality of digital converters converting the output of one of the plurality of amplifiers into a binary representation; and

a multiplexer, the multiplexer being coupled to an output of each of the plurality of digital converters and multiplexing the outputs of the digital converters onto an output signal line.

17. The device of claim 16, wherein each of the electrodes includes a nano-wire and the output signal line includes a micro-wire.